

REMARKS

Status of the Application:

Claims 001-051 are the claims of record of the application. Claims 001-0051 have been rejected and claims 1-8, 11-17, 19-22, 24, 27, 28, 30, 35, 37, and 38 have been objected to.

Amendment to the Specification and Abstract

Per the request made by the Examiner in the Office Action, Applicants have amended the specification to update information on any applications mentioned in paragraphs [0001], [0010], [0044], [0057], [0077], [00157], [00175], and [00177] to reflect any changes in the status of the referenced applications.

The Office objected to the Abstract because it exceeded 150 words and had grammatical errors. Applicants have included a replacement that overcomes these objections.

Amendment to the Claims:

Applicants have amended the claims to correct informalities identified by the Office.

Claim Objections

Applicants appreciate the Examiner's diligence in detecting and pointing out numerous informalities, and for suggesting corrections. The claims have been amended as suggested, with some minor variations.

Claim Rejections -35 USC § 112 Second Paragraph (Indefiniteness)

Claims 1-51 were rejected under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to independent claim 1, in paragraph 31, the Office suggested claim 1 is indefinite because the recitation of "a memory subsystem coupled to the initial channel calculator initially to store the function of the initial channel response, and then to store updates of the function of the initial channel response" would cover both the memory subsystem storing the updates in place of the initial channel response and the memory subsystem storing the updates in addition to the initial channel response.

Applicants respectfully traverse this rejection. The two alternatives cited by the examiner are two embodiments. The memory subsystem initially stores the initial channel response. It later stores the updates. The invention functions both ways, that is, the invention works in the case the memory subsystem first stores only the initial channel response and then stores only the updates. The invention also works if the memory subsystem then stores both the update and the initial channel response. Hence, the claim is not indefinite. Both embodiments are covered by the language. Hence the recitation of " a memory subsystem" in claim 1 is believed definite. Withdrawal of this ground for rejecting this claim is requested.

In paragraph 32, the Office suggested that there is insufficient antecedent basis in claim 1 for the limitation "the respective channel." Applicants respectfully disagree. Each subcarrier experiences a channel, and hence, there is **inherently** a channel for each subcarrier. However, purely in the interest of rapidly moving prosecution forward, Applicants have added –of each subcarrier—after "respective channel."

In paragraph 33, the Office suggested that there is insufficient antecedent basis for the "the contents of the memory subsystem." Applicants respectfully disagree. One of ordinary skill in the art would clearly understand that the contents referred to here are the latest updates from the contents. However, purely in the interest of rapidly moving prosecution forward, Applicants have added –the latest updates from—before "the contents."

In paragraph 34, the Office asserts that the limitation in claim 1 of "the pre-decision constellation values" has insufficient antecedent basis. Applicants have amended the claim.

In paragraph 35, the Office asserts that the limitation in claim 1 of "the pre-update contents of the memory subsystem" has insufficient antecedent basis. Applicants have amended to make clear that this refers to the pre-update function stored in the memory subsystem. Similarly, paragraph 36 asserts that the limitation in claim 1 of "to update the memory subsystem with a weighted sum of the pre-update contents of the memory subsystem and an update" is not clear, and this part has been amended.

In paragraph 37, the Office asserted that the recitation of the forming of the measure of the channel drift using the post decision and pre-decision constellation values is not clear. The amendment should clarify.

In paragraph 38, the Office asserted "the relative weightings" has insufficient antecedent basis. Applicants respectively disagree. A weighted sum inherently provides relative weightings.

Applicants have considered each and every recitation in claim 1 rejected under 35 USC 112, and has either amended the claim or provided argument such that claim 1, as amended, is patentable under 35 USC 112.

Claims 2–27 depend on claim 1, and are therefore also allowable under 35 USC 112. However, in view of the effort made by the Examiner in the Office Action, Applicants have responded to the rejections of the dependent claims as well, in the case that the examiner remains unconvinced by the arguments and/or amendments of the independent claim.

With respect to claim 2, in paragraph 39, the limitation "the known value" has been asserted to have insufficient antecedent basis for this limitation in the claim. Applicants respectfully disagree and assert that a known part inherently has a known value for the subcarriers. However, purely in the interest of rapidly progressing prosecution, Applicants have amended the claim to include a recitation that the known part of the transmitted part includes a known value for each subcarrier.

Paragraph 40 of the Office Action states there is lack of clarity in the recitation of "a factoring of the known part," and this recitation has been amended.

Paragraph 41 of the Office Action states the limitation "channel correcting" in lines 4-5 has insufficient antecedent basis. Applicants respectfully disagree. A term without "said" or a definite article requires no antecedent basis. Furthermore, because there is only one recitation of correcting channels in the recitation of what the channel corrector does, it would be clear to one of ordinary skill in the art that this refers to the correcting for the respective channel. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 1 to state that the channel corrector is to "channel correct" and amended claim 2 to explicitly recite the feature.

Thus, Applicants have considered each and every recitation in claim 2 rejected under 35 USC 112, and either amended the claim or provided argument such that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 3, in paragraph 43, the limitation "the known value" has been asserted to have insufficient antecedent basis for this limitation in the claim. Applicants assert that a known part inherently has a known value for the subcarriers. However, purely in the interest of rapidly progressing prosecution, Applicants have amended the claim to include a recitation that the known part of the transmitted part includes a known value for each subcarrier. In addition, the recitation of the factoring has been amended. Applicants have thus considered each and every recitation in the claim rejected under 35 USC 112, and either amended the claim or provided argument such that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 6, in paragraph 44, the Office suggests it is not clear that the decision and channel drift circuit makes decisions. Applicants respectfully suggest that it is inherent that forming post-decision values includes making a decision. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 1 to state this explicitly.

With respect to claim 7, in paragraph 45, the recitation of decisions has been rejected because the Office asserts claim 1 never discloses that the decision circuit makes any decision. Applicants respectfully suggest that it is inherent that forming post-decision values includes making a decision. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 1 to state this explicitly.

Furthermore, one of ordinary skill in the art would understand what is meant by a "re-encoded decoded decision," even without the specification, and particularly in view of the specification. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 6 to state that producing re-encoded decoded decisions uses decoded decisions.

With respect to claim 8, in paragraph 46, the Office asserts that the recitation of "the pilot correction circuit to correct for one or both of channel drift and timing errors, such that the channel corrector need not account for carrier drift and timing errors in correcting for the channel" is confusing, and for example, suggests that there may not be need for pilot correction. Pilot correction is well known in the art and improves upon any correction that occurs without pilot correction. In the interest of rapidly progressing prosecution of the case, Applicants have removed the phrase "such that the channel corrector need not account for carrier drift and timing errors in correcting for the channel."

With respect to claim 9, the office has suggested the recitation of "wherein the receiver" might be confusing because the apparatus is in the receiver. Applicants suggest that one of ordinary skill in the art would not see such confusion. However, purely in the interest of rapidly progressing prosecution of the case, have amended the claim to state that the apparatus further comprises a circuit to measure the signal quality.

With respect to claim 10, because of the amendment to claim 9, the only recitation rejected is that "the receiver is to receive a packet..." The apparatus is in the receiver (and might be the whole receiver). That the receiver is to receive is perfectly clear, and the claim is therefore allowable over 35 USC 112.

With respect to claim 12, paragraph 49 asserts that there is insufficient antecedent basis for "the measure of EVM". The error vector magnitude is an inherent property, and this would be known to one of ordinary skill in the art. The claim is therefore allowable over 35 USC 112.

With respect to claim 16, paragraph 50 asserts that there is insufficient antecedent basis for "the decision made for each constellation point." Applicants respectfully disagree, and suggest that it is inherent that forming post-decision values as recited in claim 1 includes making a decision. Furthermore, it would be clear that making a decision would be for constellation points. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 1 to explicitly state that decisions are made.

Paragraph 51 asserts that there is insufficient antecedent bases for "the inverse re-modulated decision value" Applicants disagree and suggest that the term "inverse modulates in line 2 provides such antecedent basis. However, purely in the interest of rapidly progressing prosecution, Applicants have amended line 2 to explicitly state "inverse re-modulates."

Paragraph 52 asserts that "a signal that varies as the measure of the channel drift" is ambiguous. Applicants disagree but nevertheless have amended the claim to state that the signal formed "is a function of the measure of the channel drift."

With respect to claim 17, the Office asserts that there is lack of antecedent basis for "the initial channel calculator". Applicants traverse. Claim 1 clearly recited "an initial channel calculator" as one of the elements.

In paragraph 54, the office asserts that "a function of the channel response" is unclear and that there is insufficient antecedent basis for "the functions of the channel responses corresponding to the second parts." Applicants respectfully traverse. There is a channel, and there is an input and a resulting received signal. There is the channel response corresponding to a first known portion, and there is the channel response corresponding to

a second known portion. The channel response is clearly an inherent property of the channel. There are two channel responses that are averaged to form the "initial" channel response of claim 1. Again, purely in the interest of rapidly moving prosecution forward, Applicants have amended the claim to first recite that there is *a* channel response corresponding to each portion.

In paragraph 56, the Office asserts there is insufficient antecedent basis for "the channel correcting". Applicants respectfully disagree. There is only one recitation of correcting channels in the recitation of what the channel corrector does. It would therefore be clear to one of ordinary skill in the art that this refers to the correcting for the respective channel. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 1 to state that the channel corrector is to "channel correct".

Applicants have thus considered each and every recitation in the claim rejected under 35 USC 112, and either amended the claim or provided argument such that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 19, the Office asserts there is insufficient antecedent basis for "the known value of the subcarrier of the known symbol." Applicants assert that a known part inherently has a known value for the subcarriers. However, purely in the interest of rapidly progressing prosecution, Applicants have amended the claim to include a recitation that the known part of the transmitted part includes a known value for each subcarrier. The Office further asserts, similarly to the assertions made with respect to claim 2, that several of the terms are unclear. The limitation "a factoring by the known part is included" has been amended. The limitation "channel correcting" is asserted to be correct. However, purely in the interest of rapidly moving prosecution forward, and as stated above for the case of claim 2, claim 1 has been amended to state that the channel corrector is to channel correct, and the recitation in claim 19 has been amended.

Applicants assert there is sufficient antecedent basis for "the channel responses." See the above argument for claim 17, on which claim 19 depends. Additionally, Applicants

have amended the claim to state that the channel responses being averaged are the responses corresponding to the first and second known portions, respectively.

The term "the subcarriers corresponding to the known symbol set" has been amended.

Applicants have thus considered each and every recitation in the claim rejected under 35 USC 112, and either amended the claim or provided argument such that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 20, the Office asserts that there is lack of clarity in the recitation that includes "factoring," that there is insufficient antecedent basis the term "the known value of the subcarrier for the known symbol," and that it is not explicitly stated what is factored. Applicants have amended the claim so that these rejections are overcome. Applicants have thus considered each and every recitation in the claim rejected under 35 USC 112, and amended the claim such that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 24, the Office asserts that it is not explicitly stated what is factored. Applicants have amended the claim so to make this clear so that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 25, the Office asserts there is insufficient antecedent basis for "the channel correcting". Applicants respectfully disagree. There is only one recitation of correcting channels in the recitation of what the channel corrector does. It would therefore be clear to one of ordinary skill in the art that this refers to the correcting for the respective channel. However, purely in the interest of rapidly progressing prosecution, Applicants have amended claim 1 to state that the channel corrector is to "channel correct."

With respect to independent claim 28, the Office asserts that "calculating a function of the initial channel response of subcarriers from the known part of the received

packet" is not clear. Applicants respectfully disagree. One of ordinary skill in the art would understand that a complete channel response for a set of subcarriers includes channel responses for the individual subcarriers. Thus, it would be clear that the initial channel response of subcarriers has multiple values for a plurality of subcarriers. A function of a quantity that has multiple values itself can have multiple values. For example, the specification a function of the channel response of the subcarriers that defined by, for each subcarrier, the product of the channel response of the subcarrier and a known value for the subcarrier. The function has a value of each subcarrier of a plurality of subcarriers.

The Office has suggested "forming post-decision values" is unclear. Applicants respectively disagree. The channel correcting forms channel-corrected constellation values. These are used to make decisions. Making the decisions form the post-decision values. However, purely in the interest of rapidly moving prosecution forward, Applicants have added a more explicit recitation of decision making.

In paragraph 69, the Office has suggested that there is insufficient antecedent basis for "the pre-update stored function". Applicants respectfully disagree. There is storing of a function, and there is a storing of updates. One of ordinary skill in the art would understand that the recitation means the stored function prior to the storing updates. However, purely in the interest of rapidly progressing prosecution, Applicants have amended the recitation of the storing updates to make clear that it includes the channel correcting, decision making, forming a measure of the channel drift, forming the weighted sum, and the storing of the weighted sum.

In paragraph 70, the Office has suggested that the recitation of forming the weighted sum is not clear. Applicants have amended the recitation. In paragraph 71, the office has suggested there is lack of clarity in the recitation of the channel drift used in the weighted sum. Applicants have amended the recitation.

In paragraph 72, the Office asserted "the relative weightings" has insufficient antecedent basis. Applicants respectively disagree. A weighted sum inherently provides relative weightings.

Applicants have thus considered each and every recitation in claim 28 rejected under 35 USC 112, and either amended the claim or provided argument such that the claim, as amended, is patentable under 35 USC 112.

Claims 29–35 depend on claim 28, and are therefore also allowable under 35 USC 112. However, in view of the effort made by the Examiner in the Office Action, Applicants have responded to the rejections of the dependent claims as well, in the case that the examiner remains unconvinced by the arguments and/or amendments of the independent claim.

With respect to claim 29, paragraph 73 repeats the assertion of lack of clarity about the function of the channel response. That the function has multiple values for the multiple subcarriers would be clear to one of ordinary skill in the art. This recitation in the claim is definite.

The office has asserted that the limitation "the known value" has been asserted to have insufficient antecedent basis for this limitation in the claim. As in the case of claim 2, Applicants disagree and assert that a known part inherently has a known value for the subcarriers. However, purely in the interest of rapidly progressing prosecution, Applicants have amended the claim to include a recitation that the known part of the transmitted part includes a known value for each subcarrier.⁷⁴

In paragraph 75, the Office suggests that the "factoring out" step is unclear as to what is factored out of the known part. There was a typographical error in the claim. It is the known part (more explicitly, the known values) that are factored out from the stored function.

The Office has suggested insufficient antecedent basis for "channel correcting." Applicants traverse. There is clear recitation of "channel correcting" in the claim.

Applicants have thus considered each and every recitation in claim 29 rejected under 35 USC 112, and either amended the claim or provided argument such that the claim, as amended, is patentable under 35 USC 112.

With respect to claim 30, the Office has again repeated its assertion of lack of clarity of the term function of the initial channel response. As asserted above for claim 28 and 29, that the function has multiple values for the multiple subcarriers would be clear to one of ordinary skill in the art. This recitation in the claim is definite. In paragraph 78, the office suggests the "factoring out" recitation is unclear. Applicants have amended the recitation. Claim 30, as amended, is believed allowable under 35 USC 112.

With respect to claims 33 and 34, the Office has asserted there is insufficient antecedent basis for "said forming the decision" Applicants have amended the claim to clarify.

With respect to claim 35, the Office has asserted there is insufficient antecedent basis for "said forming the decision" Applicants have amended the claim to clarify. The Office has suggested insufficient antecedent basis for "channel correcting." Applicants traverse. There is clear recitation of "channel correcting" in the claim. The claim is believed allowable under 35 USC 112, and withdrawal of the rejection id respectfully requested.

With respect to independent claim 36, the Office has asserted some lack of clarity as to what constitutes making a decision and what is re-modulating the result of so making a decision. Applicants respectfully traverse. Those of ordinary skill in the art will understand that making a decision is a demodulation operation of digitally modulated signals. In the context of the field of the invention, those of ordinary skill in the art will understand de-modulation involves making decisions about constellation points. Re-modulation forms modulated signals from something related to the result of demodulating, i.e., using the results of the decision making. Furthermore, this is explained in the specification. The claim is definite and allowable under 35 USC 112, and withdrawal of the rejection id respectfully requested.

Claims 37–43 depend on claim 36, and are therefore also allowable under 35 USC 112. However, in view of the effort made by the Examiner in the Office Action,

Applicants have responded to the rejections of the dependent claims as well, in the case that the examiner remains unconvinced by the arguments and/or amendments of the independent claim.

With respect to claim 38, the Office has asserted some lack of clarity in "post factoring" recitation. Applicants have amended the claim to include a factoring out step. The claim, as amended, is now believed allowable under 35 USC 112.

With respect to claim 40, the Office has asserted that there is insufficient antecedent basis for "the quantity stored for the subcarrier". Applicants respectfully disagree. There is a storing in parent claim 36, the storing stores quantities for each subcarrier, so that inherently there is a quantity stored for the subcarrier. However, purely in the interest of rapidly progressing prosecution, Applicants have amended the recitation.

With respect to claim 42, the Office as asserted that: "wherein making the decision includes demodulating, decoding, and re-coding to form a re-coded-decoded decision" is unclear. Applicants respectfully disagree. It is clear that there is demodulation, decoding, and re-coding. The term clearly refers to making a decision based on data after the re-modulating decoding and re-coding. One would clearly understand this from the context and the term "re-coded-decoded decision." However, purely in the interest of rapidly progressing prosecution, Applicants have amended the recitation to explicitly state the re-coded-decoded decision is based on data after the re-modulating decoding and re-coding.

With respect to independent claim 43, the Office as asserted possible confusion the terms "a pre-decision constellation point" and "a postdecision constellation point value." There is no lack of clarity. One of ordinary skill in the art would understand that a decision circuit accepts a pre-decision constellation value, and makes a decision, i.e., demodulates. The demodulated data can be re-modulated by a re-modulator. Re-modulation also forms a constellation point value which the Applicants recite as a "post-decision" constellation point value to indicate that it is post-decision, and to indicate that it

is not the pre-decision constellation point value. The claim is believed allowable under 35 USC 112. Withdrawal of the rejection is respectfully requested.

Claims 44–51 depend on claim 43, and are therefore also allowable under 35 USC 112. However, in view of the effort made by the Examiner in the Office Action, Applicants have responded to the rejections of the dependent claims as well, in the case that the examiner remains unconvinced by the arguments and/or amendments of the independent claim.

With respect to claim 45, the office asserts that it is unclear what constitutes "post-factoring". The Applicants have added an explicit recitation that the apparatus is also configured to factor out the known value.

With respect to each of claims 46 and 47, in paragraphs 89 and 90, the Office asserts that "the memory contents" is unclear. Applicants respectfully disagree. A claim cannot be read out of context. Applicants suggest that in the context, it would be clear to one of ordinary skill in the art that this means the stored function or the updated stored function if there has been an update. However, purely in the interest of rapidly moving prosecution forward, Applicants have amended these claims to recite the stored function or the updated stored function if there has been an update. Claims 46 and 47 are believed allowable under 35 USC 112, and withdrawal of the rejection is respectfully requested.

With respect to claim 48, the Office asserts that "hard demodulated decision" is unclear. Applicants respectfully disagree. It would be clear to one of ordinary skill in the art that the function of demodulating a digitally modulated signal includes making a decision, hence the decision is a "demodulated" decision. Furthermore, those of ordinary skill in the art would understand the difference between a hard decision and a soft decision. Moreover, this feature is explained in the specification. Hence the term a "hard demodulated decision" is clear. Claim 48 is believed allowable under 35 USC 112, and withdrawal of the rejection is respectfully requested.

With respect to claim 50, in paragraph 92, the Office asserts that there is insufficient antecedent basis for "the post-decision inverse re-modulated value". Applicants respectfully disagree. The claim recited that the re-modulator inverse re-modulates. The term "re-modulated," by the meaning of the pre-fix "re" inherently means there is a demodulated, i.e., post-decision value. Hence there is sufficient antecedent basis for post-decision inverse re-modulated value. The Claim is believed allowable under 35 USC 112, and withdrawal of the rejection is respectfully requested.

Finally, ***with respect to claim 51***, the Office asserts that "re-coded-decoded decision" is unclear as to what forms the original decision. Applicants respectfully disagree. One of ordinary skill in the art would understand that the recited demodulator forms a decision, such that the term re-coded-decoded decision implies a demodulation (an original decision based on a received signal that is coded), a decoder, and a re-coder to produce an output from which a re-coded decoded decision is made. Furthermore, this is explained in the specification. Hence the meaning of the claim is clear, the claim is definite. The Claim is believed allowable under 35 USC 112, and withdrawal of the rejection is respectfully requested.

Applicants have considered each and every rejection of the independent and dependent claims rejected under 35 USC 112, and either amended the claim or provided argument such that the claims, as amended if amended, are allowable under 35 USC 112.

The cited prior art

No rejections have been made over any cited prior art. Therefore, the claims are therefore assumed allowable over the cited prior art.

For these reasons, and in view of the above amendment, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Conclusion

The Applicants believe all of Examiner's rejections have been overcome with respect to all remaining claims (as amended), and that the remaining claims are allowable. Action to that end is respectfully requested.

If the Examiner has any questions or comments that would advance the prosecution and allowance of this application, an email message to the undersigned at dov@inventek.com, or a telephone call to the undersigned at +1-510-547-3378 is requested.

Respectfully Submitted,

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Date

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